

# PTB 20171

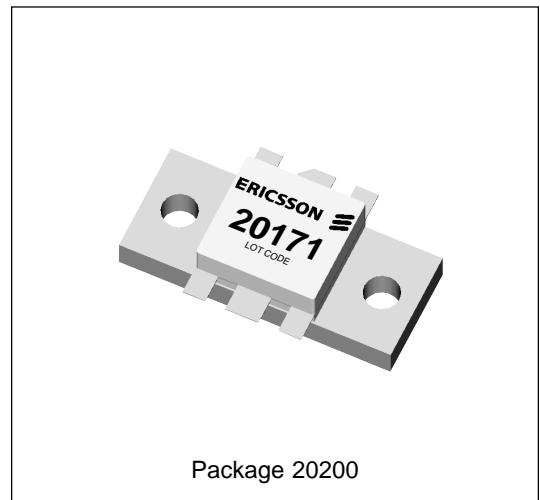
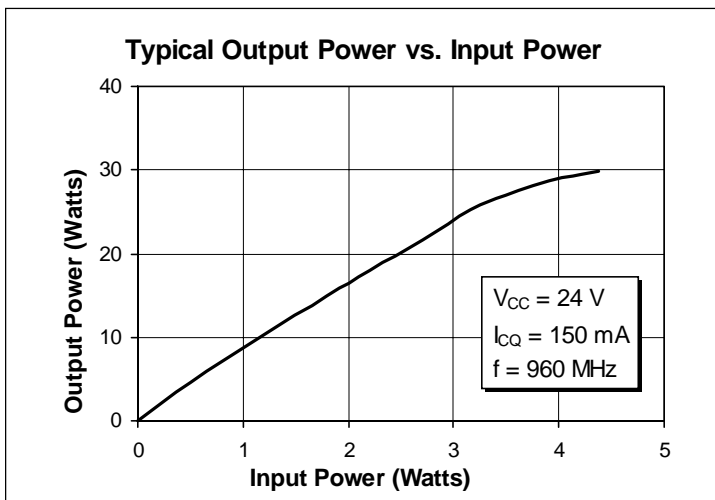
## 25 Watts, 935–960 MHz

### Cellular Radio RF Power Transistor

#### Description

The 20171 is a class AB, NPN, common emitter RF power transistor intended for 24 Vdc operation from 935 to 960 MHz. Rated at 25 watts minimum output power, it may be used for both CW and PEP applications. Ion implantation, nitride surface passivation and gold metallization are used to ensure excellent device reliability. 100% lot traceability is standard.

- 25 Watts, 935–960 MHz
- Class AB Characteristics
- Gold Metallization
- Silicon Nitride Passivated



#### Maximum Ratings

| Parameter   | Symbol          | Value        | Unit                         |
|---|-----------------|--------------|------------------------------|
| Collector-Emitter Voltage   | $V_{CER}$       | 50           | Vdc                          |
| Collector-Base Voltage  | $V_{CBO}$       | 50           | Vdc                          |
| Emitter-Base Voltage (collector open)   | $V_{EBO}$       | 4.0          | Vdc                          |
| Collector Current (continuous)  | $I_C$           | 5.0          | Adc                          |
| Total Device Dissipation at $T_{flange} = 25^\circ\text{C}$<br>Above $25^\circ\text{C}$ derate by | $P_D$           | 145<br>0.833 | Watts<br>W/ $^\circ\text{C}$ |
| Storage Temperature Range   | $T_{STG}$       | -40 to +150  | $^\circ\text{C}$             |
| Thermal Resistance ( $T_{flange} = 70^\circ\text{C}$ )  | $R_{\theta JC}$ | 1.2          | $^\circ\text{C}/\text{W}$    |

## Electrical Characteristics (100% Tested)

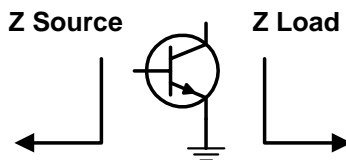
| Characteristic           | Conditions   | Symbol        | Min | Typ | Max | Units |
|--------------------------|--|---------------|-----|-----|-----|-------|
| Breakdown Voltage C to E | $I_B = 0 \text{ A}, I_C = 10 \text{ mA}, R_{BE} = 22 \ \Omega$ | $V_{(BR)CER}$ | 50  | 50  | —   | Volts |
| Breakdown Voltage C to E | $V_{BE} = 0 \text{ V}, I_C = 10 \text{ mA}$                    | $V_{(BR)CES}$ | 55  | 60  | —   | Volts |
| Breakdown Voltage E to B | $I_C = 0 \text{ A}, I_E = 5 \text{ mA}$                        | $V_{(BR)EBO}$ | 4   | 5   | —   | Volts |
| DC Current Gain          | $V_{CE} = 5 \text{ V}, I_C = 1 \text{ A}$                      | $h_{FE}$      | 20  | 40  | —   | —     |

## RF Specifications (100% Tested)

| Characteristic  | Symbol   | Min | Typ  | Max  | Units |
|---|----------|-----|------|------|-------|
| <b>Gain</b><br>( $V_{CC} = 24 \text{ Vdc}, P_{out} = 25 \text{ W}, I_{CQ} = 150 \text{ mA}, f = 960 \text{ MHz}$ )  | $G_{pe}$ | —   | 10.0 | —    | dB    |
| <b>Collector Efficiency</b><br>( $V_{CC} = 24 \text{ Vdc}, P_{out} = 25 \text{ W}, I_{CQ} = 150 \text{ mA}, f = 960 \text{ MHz}$ )  | $\eta_C$ | —   | 55   | —    | %     |
| <b>Load Mismatch Tolerance</b><br>( $V_{CC} = 24 \text{ Vdc}, P_{out} = 25 \text{ W}, I_{CQ} = 150 \text{ mA}, f = 960 \text{ MHz}$ —all phase angles at frequency of test) | $\Psi$   | —   | —    | 10:1 | —     |

## Impedance Data (data shown for fixed-tuned broadband circuit)

( $V_{CC} = 24 \text{ Vdc}, P_{out} = 25 \text{ W}, I_{CQ} = 150 \text{ mA}$ )



| Frequency | Z Source |        | Z Load |       |
|-----------|----------|--------|--------|-------|
|           | R        | jX     | R      | jX    |
| 935       | 4.25     | -10.09 | 11.92  | -8.34 |
| 947       | 4.11     | -9.81  | 11.66  | -8.47 |
| 960       | 3.97     | -9.66  | 11.34  | -8.83 |